

must obviously be didactic. This method, however, has its limits; in this case we think these limits have been somewhat exceeded. The student, or even the practitioner, who does not supplement the knowledge of gout he has obtained from this source by some further reading will not, we are afraid, be in possession of the whole truth concerning this disease.

The remainder of the book is devoted to the diseases of the blood, the section being introduced by a chapter upon the blood under normal conditions, by Dr. Louis Jenner. This chapter will be found exceedingly useful to those interested in this subject; it is concise and up-to-date, and deals with the more generally employed technique. The diseases of the blood themselves are dealt with by Dr. Sidney Coupland.

In the case of the work before us, the reviewer finds himself in rather an anomalous position in that the editor has written no preface, so that it is difficult to know by what standard the book should be judged. From a careful perusal of it we should place it mid-way between a book of reference and an ordinary text-book of medicine. Had it contained fuller references to the literature it might almost have ranked as a reference-book; as it is, it will no doubt fill a very useful place, which it thoroughly deserves to do, in the library of the advanced medical student and the practitioner.

A NEW CLASSIFICATION OF THE REPTILES.

Beitrag zur Systematik und Genealogie der Reptilien.

By Prof. Max Fürbringer. Pp. 91. (Jena: Fischer, 1900.) Price Mk. 2.50.

IN the year 1873 Prof. Fürbringer, who has quite recently succeeded his illustrious master in the chair of comparative anatomy at Heidelberg, commenced to publish a series of contributions to the morphology of the pectoral girdle of reptiles, with special reference to the myology, the fourth and concluding part of which has now appeared. This highly elaborate piece of work is supplemented by a chapter entitled "*Beitrag zur Systematik und Genealogie der Reptilien*," in which the author sets forth his views on the phylogenetic arrangement of the class Reptilia.

As regards the origin of reptiles, the numerous fossil remains with which we are already acquainted seem to indicate so complete a passage from the Stegocephalous Batrachians, that the question at issue has lately been where to draw the dividing line between the two classes, an uncertainty which is further emphasised by the fact that the Microsauria, such as *Hylonomus* and *Petrobates*, of Carboniferous age, placed by most authorities among the Stegocephala, are included in the Reptilia by Prof. Fürbringer. From a knowledge of these connecting forms the conclusion must, it seems, follow that the ancestors of the Reptilia proper, themselves probably derived from Crossopterygian Fishes, as believed by Cope, Baur, and many other modern zoologists, possessed a skull with numerous membrane bones roofing over the temporal and occipital regions and with an immovable quadrate, that they belonged, in fact, to the type designated by Cope as monimostylic. In the process of evolution, in the series known as the Squamata (lizards

and snakes), the predominant modern reptilian type, the number of membrane bones having been reduced and the temple left more and more unprotected, the quadrate became free and more or less movably articulated to the squamosal and supratemporal (streptostylic skull of Cope). The direction of the line of evolution in this instance, running as it does concurrently with the reduction and disappearance of the limbs, seems clear enough, and it is further supported by geological data, all early Reptiles and Batrachians being monimostylic without a known exception, whilst the streptostylic types appear first in the Jurassic as Lacertilia, to be followed by Snakes in the Eocene.

These conclusions are, however, set aside by Prof. Fürbringer. For him, the streptostylic condition is the primitive one, and, from the partial homology which he believes to have established between the spheno-pterygo-quadrate muscle of the Lacertilia and the *tensor veli maxillae superioris* of Selachians, he is led to look upon the condition exhibited by Geckos and Monitors as nearer the original one than that known in *Sphenodon*, in which the said muscle is much reduced. From this sole consideration, and by the purely gratuitous assumption that some early Rhynchocephalians, such as *Kadaliosaurus*, and Microsaurians may eventually prove to have been streptostylic, the author thinks himself justified in holding that the ancestral types from which the Lacertilians have been derived cannot be sought for among either the Stegocephalians or the Rhynchocephalians with the cranial structure of which we are at present acquainted, but that they will be found to be connected with some primitive hypothetical Amphibian type in which the quadrate was movably articulated with the skull, as in the lowest form of living Selachians.

"That such primitive streptostylic Amphibians have once existed, is rendered probable by the facts ascertained in the ontogeny of the living Amphibians. Probably streptostylic became converted into monimostylic as, in the course of evolution, their originally superficial apparatus of dermal bones became more and more intimately connected with the quadrate, the mobility of which consequently lessened and finally completely ceased."

This reasoning, by which, on the ground of the imperfections of the geological record, chronological indications are absolutely ignored, is not likely to meet with general favour. After the multitude of well-preserved Carboniferous and Permian "Eotetrapoda" which have lately been discovered and described by Credner, Fritsch and others, it will be difficult to accept the author's teaching that we know practically nothing of the progenitors of existing reptiles, and that these must be connected through a series of hypothetical Proamphibia or Protetrapoda with equally hypothetical Selachian-like animals.

As a consequence of the above assumption, the new classification differs fundamentally from those hitherto based on phylogenetic considerations, in this, that the Streptostylia s. Squamata, with the two orders Lacertilia and Ophidia, are placed at the base of the series. The Rhynchocephalia, Acrosauria, Microsauria and Ichthyopterygia are associated with them in a subclass Tocosauria. A second subclass, Theromorpha s. Theromora, includes the Dicynodonts, Anomodonts and Pariasaurians; a third, Synaptosauria, the Mesosaurians, Sauropterygians

and Chelonians; whilst in a fourth, Archosauria, the Crocodilians, Dinosaurs and Pterodactyles are brought together. Little objection will be found to the composition of the second and fourth subclasses, as it answers to the views held by almost all modern classificators. But it is difficult to believe that the proposal to group the Squamata, Rhynchocephalia and Ichthyosauria in a group equivalent and opposed to the one including Mesosauria, Plesiosauria and Chelonia, will meet with ready acceptance. It would, however, carry us too far to enter on this occasion into a discussion of the reasons that have determined the author to adopt such an arrangement.

But it may not be out of place here to enter a protest against the introduction of new terms for higher divisions, such as Patagiosauria for the well-known Ornithosauria or Pterosauria, Gecko-Chamæleontes s. Uroplatinomorpha for the group already named Uroplatoidea by Gill and Geccovarani by Cope, on the mere ground of the new names being more expressive. *À propos* of the last-named division, it is indeed startling to learn that the long-sought ancestor of the Chameleons is believed by Prof. Fürbringer to be approximated by the curious *Uroplates* of Madagascar which, formerly placed with the Geckos, was first raised to family rank on the ground of the difference in the shape of the clavicular arch. However, the arguments brought forward by the learned professor in favour of this hypothesis do not seem very convincing.

The limits assigned to this notice do not permit of attention being drawn to the many other salient points in the new classification, and to the incidental remarks on the relationships which birds and mammals bear to the reptiles. Suffice it to say that Prof. Fürbringer's work is, like everything we owe to his marvellous industry, most elaborate and careful, and that the very complete bibliographical indications that accompany it constitute in themselves a valuable mine of information for the student of the morphology and taxonomy of the reptiles.

G. A. B.

OUR BOOK SHELF.

A Practical Guide to Garden Plants. By John Weathers. Pp. 1192 + xii. (London: Longmans, Green and Co., 1901.) Price 21s. net.

THE garden plants here dealt with are those which are hardy enough to be cultivated in the open air, and they comprise not only ornamental plants but fruits and vegetables. A well-constructed glossary precedes the body of the work. The earlier portions are devoted to the life-history of cultivated plants, which is well done so far as it goes, but which would bear to be considerably expanded. It is rather misleading to call oxygen, carbon, hydrogen, nitrogen and the other elementary substances which the chemist finds in plants, different kinds of food. They are the materials of which food is made, but not the food itself.

The bulk of the work is made up of descriptions of the various hardy plants generally grown in gardens, together with indications for their cultivation.

The plants named are arranged in their natural orders, which is a great boon to the amateur, greatly facilitates the acquisition of knowledge, and adds to the interest of the plant. "If the cultivator," says the author, "has even only a slight knowledge of the way in which plants have been grouped more or less naturally by botanists,

he may, by the aid of his books, run the unknown plant very close, if not quite, to its own group from the characters he sees. But if his books have the plants arranged simply in alphabetical order according to their names and not according to their relationships, he may as well give up his search at once unless he has the time and inclination to wade through every name from A to Z. Indeed, descriptive plant-books, arranged in purely alphabetical order, are only of value when the proper name of the plant about which information is required is already known."

From long experience we can confirm the author's statement. It is the fashion nowadays to neglect the comparative study of plants as they now exist, but, looking at the matter from a utilitarian point of view, it is of much greater use to be able to recognise the distinctions between one natural order and another than it is to indulge in speculative and conjectural genealogies. In any case, a knowledge, even though it be slight, of the principal natural orders adds greatly to the interest of a garden and often affords useful indications for cultivation. Mr. Weathers has sometimes supplied English names for the orders which appear to us as to be unnecessary—for instance, why should we have to learn that the Magnolia order is called the Lily-tree order, or why should the Leguminosæ be called the Laburnum and Broom order? The Latin names of the orders present, as a rule, little or no difficulty to those who really desire to know them. For those who do not, it is not necessary to put one's self to inconvenience. This portion of the work is excellent for reference purposes, and must have entailed great labour on the author.

The sections relating to fruit and vegetables are not so satisfactory, but, on the whole, the book is well calculated to satisfy the requirements of the amateur and of the professional gardener, the more so as it is provided with an excellent index.

Ausgewählte Methoden der Analytischen Chemie. By Prof. Dr. A. Classen. Erster Band. Pp. xx + 940. (Brunswick: Vieweg und Sohn, 1901.)

THE first impression which this volume on select methods of analysis conveys is entirely favourable. The book is well printed, tastefully bound, and furnished with those delicate illustrations of apparatus which are characteristic of German chemical books.

The chief desideratum in a work on analysis is that the author shall not only be a skilled analyst, but that he shall have had personal experience of the methods which he describes.

Prof. Classen's connection with analytical chemistry, especially with the introduction of electrolytic methods, is too well known to leave any doubt as to his qualifications as an analyst, and we are assured by him in the preface that "In diesem Buche sind demnach diejenigen Methoden vorzugsweise beschrieben worden, welche ich persönlich vielfach anwandte, oder welche durch meine Assistenten und Schüler oder von dritten Seite kritisch geprüft wurden."

We can only admire the zeal and industry of the author and his assistants in having been able to examine critically even half the methods described in these 900 pages of closely printed matter. In reviewing a book of this kind, one naturally turns to the description of processes with which one is familiar. Judged by this test it fully justifies its first impressions. It is furnished with that minuteness of detail which is requisite in any book on quantitative and especially technical analysis, as this professes to be.

In addition to the estimation and separation of the commoner metals, considerable space is devoted to the rarer ones, some of which, like cerium and its allies, have recently entered the field of technical chemistry.

It seems odd that in a work relating entirely to metals